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ABSTRACT

The way information is visually designed and synthesized greatly affects how people understand and use that information. Increased use of the World Wide Web as a teaching tool makes it imperative to question how visual/verbal information presented via the Web can increase or restrict understanding. The purpose of this study was to examine students' perceptions of the effectiveness of visuals in conveying the instructional message in an educational Web course. Participants were 15 seven-, eight-, and nine-year-old students. The students were asked about the design of the pages using one of the top Web course sites for children. Questions focused on information/instructional purposes, graphic/picture elements, text/lettering elements, color, layout, and texturing. Results indicated the following: (1) none of the students understood that all the sites dealt with child safety; (2) the majority of the students understood the concept of the sites as they read the information being presented, and at this point, did not use the visual designs to interpret the meaning of the sites; (3) the visual designs did not help the students make an association with the information being given; (4) students liked the color of the lettering and the background, which used cold colors; (5) students liked the uniformed layout of the sites, and none had difficulty moving from one location to another. (AEF)

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Perception Of Elementary Students Of Visuals On The Web

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Abstract

The way information is visually designed and synthesized greatly affects how people understand and use that information. Educators have long been aware that conceptual and perceptual styles, past experiences, and cultural background affect the way people learn. Good teachers consider individual differences and learning styles as they teach. Now, increased use of the World Wide Web as a teaching tool makes it imperative to question how visual/verbal information presented via the WWW can increase or restrict understanding. The purpose of this study is to examine students' perceptions of the effectiveness of visuals in conveying the instructional message.

Introduction

Today's rapid advancement of new technologies has made the impact that visual images have on education very evident. Heinich, Molenda and Russell (1993) stated, "We are a visual society; one that has experienced the increasing production and distribution of visual messages in recent years" (p. 66).

One of the more prominent emerging technologies is the World Wide Web (WWW). An ever growing number of educational sites are being developed on the World Wide Web to provide a source of information for teachers and students. The graphical user-friendly features of the World Wide Web allow for greater versatility of presentation design. The Web designers are able to accommodate a wider range of learning preferences by using Web attributes such as sound, images, and text. The educational sites are generally useful in content. However, the quality of the design, from an instructional design perspective, is not always what it should be (El-Tigi & Branch, in press).

The purpose of this study is to examine students' perception of the effectiveness of visuals in conveying the instructional message. The contention is that good instructional design provides procedures for assessing the quality of the graphics in terms of how they are perceived by the intended audience.

The focus of this study is to examine specific visual design elements specified by researchers (Heinich, Molenda and Russell, 1993) as attributes of quality visuals. The research question is: How does the intended audience perceive the effectiveness and meaningfulness of the visuals presented in terms of the following:

- information/instructional purposes graphic/picture elements
- text/lettering elements
- color
- layout

Designing with Learning Preferences in Mind

The process of designing effective instructional media relies upon careful planning. The planning should include a needs analysis and a learners analysis. The learners analysis must contain the learner's learning preference (Dick and Carey 1996). A learner's learning preferences may be one of the following:

- visual: a learner prefers to read rather than listen to discussions;

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- auditory: a learner prefers to listen to a tape and/or discussions rather than read; and
- kinesthetic: a learner prefers concrete experiences rather than abstract learning.

Therefore, a designer must create with all three of the learning preferences in mind. In a Web Course design, the designer should include written language with audio script of the text for the auditory learner. The course should include graphic pictures that represent the meaning of the text for the visual learner.

Learning from Visuals

According to Heinich, Molenda and Russell (1993), students learn from visuals by being able to read, understand, and interpret visuals accurately. Thus, the students decode the information that they see. The students must also be able to encode information by creating a visual in order to communicate effectively with others through the visuals.

When visuals are used in a Web site, the images are used to illustrate something. The images should illustrate as accurately as possible the designer's point of instruction. They should be realistic pictures that allow the learner to create an association between the text and the image. The image should help cue the student learning process. For example: if the designer's site is informing children about poison, the designer might include a graphic of skull with two bones crossing making an "X". This symbol is the common symbol for poison.

Designing Visual Material for Learning

Meaningful learning is one of the fundamental tenants of instructional design. According to Ausubel (1968), material presented is comprehended in the process of internalization. Visuals serve as concrete clues to meaning. Concrete referents enhance communication and understanding through clarification of abstract concepts. Heinich, Molenda, & Russell (1993) state that visuals "Attract attention, sustain attention, and generate emotion" (p. 66). Consequently, visuals aid reiteration of information by allowing easier storage and retrieval of information. Ultimately, visuals can also motivate learners by increasing their interest in the text.

There are several factors to consider when designing visuals for instructional purposes. Among these factors are color selection, layout of visual and verbal elements, text and lettering and texture among others.

Text/Lettering Elements

Three factors ought to be considered in the design process: style, color of text and size of text. Heinich, Molenda, and Russell (1993) recommend that consistency and harmony with other elements influence the choice of style. Plain style is suggested for use for instructional material. Lowercase letters are most legible. Short headlines maybe written in all caps as long as they do not exceed three words. The color of text ought to be selected based on how well it contrasts with the background color. Contrast enhances legibility, while stronger contrast achieves greater emphasis. Finally the size of lettering ought to be estimated based on the distance from which it will be read. Therefore, larger text size should be used for bigger classrooms.

Color

Research attributes mood and movement to color. Color commands attention and enhances visual impact. Color serves to heighten realism of image; point out similarities and differences; highlight important information and detail; and create a particular emotional response (Heinich, Molenda, and Russell, 1993). Colors could be categorized into cool and warm colors. Warm colors such as red, yellow and orange could be used to approach the viewer to gain the readers attention. In contrast, cool colors such as blue, green, and violet tend to retract.

Layout

The arrangement of the text and graphics help the design into a logical sequence for learning. Faioloa and Debloois (1988) found that dividing larger portions of information into smaller units of information improves visual clarity and results in improved retention of information. Therefore, the arrangement of the information should be consistent throughout the design of the course because the learner needs to concentrate on the content of the information and not the way it is presented.

Texture

Texture is a characteristic of three dimensional objects and materials. It serves to convey a clearer idea of the subject to the viewer by suggesting the sense of touch. Texture provides emphasis, separation, or enhances unity. Given the multi-dimensional attributes of the Web, scanned images, cartoon characters and texture enhanced images are easily depicted.

Method

The designer should be creating Web courses with the learner in mind. In order to see the extent to which the learners could contribute to the evaluation of an instructional material on the Web, we interviewed elementary students on their perception of visual design in a Web course.

Participants

Participants of the study are 7, 8 and 9 year olds. Fifteen students were able to participate in the study. Students were asked their overall understanding of the topic, their learning preference and their perception of the visual aids in the course.

Table 1 Participants

Male	6
Female	9
7 year olds	1
8 year olds	1
9 year olds	13
3rd Grade	2
4th Grade	13

Data Collection Procedures

We used one of the top 5% (rated by Point Communication Corporation) Web course sites for children. We selected this site due to the appropriateness of the content, which is specifically geared to that population group.

A ten-item survey was designed to elicit specific responses regarding comprehension of instructional message based on both image cues and text. Pages geared at three specific situations were selected out of approximately 20 sets. The selection process was based on a pilot study which helped determine the most useful content to the specific age group and also the overall quality of the information and visuals provided. The best three were selected based on this criteria. We asked the children about the design of the pages including:

- information/instructional purposes
- graphic/picture elements
- text/lettering elements
- color
- layout
- texturing

Students were interviewed in 10 minute segments given their short attention span and also the constraints of conducting an interview during specific class hours.

Data Analysis

Information/instructional purposes

Throughout the interviewing process, none of the students understood that all the sites dealt with kid safety. This phenomenon was expected by the researchers because the Web course only mentioned the performance

objectives on the beginning home page. This is interesting because a key principal of Instructional Design is a clear statement of the performance objective for every introduction of a new instructional event. Listed below are the students perception of the Web sites.

What do you think the Web site is about?

Site 1: Telephone Safety

- telephone
- teacher about to teach - sitting at a desk
- when you are alone
- waiting for a call - thinking about answering the phone
- telephone
- principal - what if the telephone
- what to do if the phone rings
- Do I answer the question- What should I do if the phone rings
- waiting for something
- answer phone
- talking about a phone
- teacher sitting at desk
- don't know what site is about

Site 2: Drug Safety

- drugs
- person drinking
- selling drinks
- sell someone drugs
- kids offering wine
- drugs and alcohol
- not sure - not to take drugs or alcohol
- drugs or alcohol
- not clear
- asks a question- what should you do
- bullies
- drinking
- drugs - alcohol because there is a beer bottle

Site 3: Poison Safety

- stay from poison
- rabbit happy
- rabbit hopping no idea what
- someone drinking cleaning stuff
- rabbit looks sick
- rabbit with yucky face - poison
- somebody swallowed some poison
- not to drink poison by reading
- rabbit scared
- poison
- no idea- I don't know
- poison site
- it says poison

As the students read the information being presented, it became apparent to the researchers that the majority of the students understood the concept of the sites (Figure 1). At this time in the research process, the students did not use the visual designs to interpret the meaning of the sites. The students comments were:

Figure 1

Tell me one thing you have to do to be safe?

Student Comments

Site 1: Telephone Safety

- never tell caller your alone - no way get a life

Site 2: Drug Safety

- say no to drugs

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- say no
- tells you to choose a different friend, nobody around
- walk away report to adult
- walk away and tell parents - several don't make sense

Site 3: Poison Safety

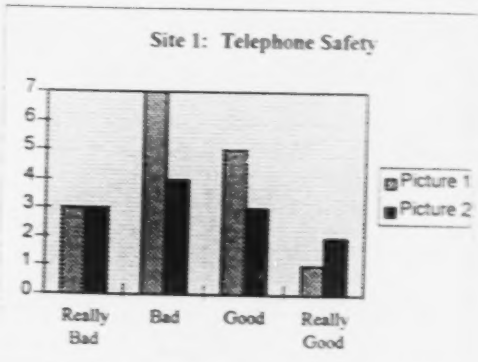
- writing tell you all the things you should do
- walk away and report to adult
- call 911

Graphic/Picture Elements

The visual designs did not help the students make an association with the information being given (Figures 2 - 4); even though, the students tried to make an association between the picture and the information being given. The following are some of the students interpretation of the visual designs.

Do the pictures help you understand what to do?

Figure 2



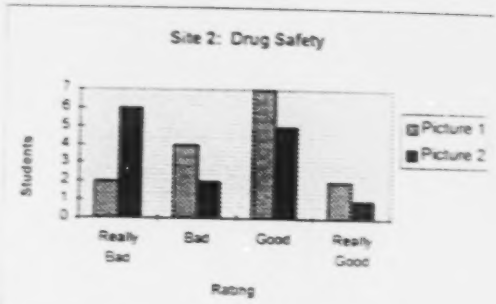
Site 1: Telephone safety Picture 1

- little/has a phone- someone is going to answer
- no clue of answer - there is a telephone
- how to deal with electricity

Picture 2

- wiggling
- nobody says no
- never say your name
- talk to parents

Figure 3



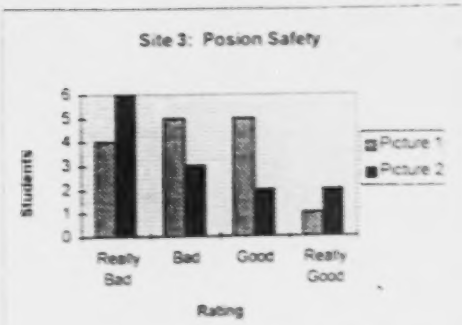
Site 2: Drug Safety Picture 1

- person drinking little hit because
- someone offering
- someone is offering
- does kid handing out wine to other kids
- picture not good
- doesn't tell if it is a bad drink
- because of XXXX on bottle
- doesn't tell about drugs

Picture 2

- dressed to go out - waiting for someone to come
- not clear
- she is not drinking any

Figure 4



Site 3: Poison Safety Picture 1

- not clear
- tell parents - say no to do whats right
- he could be screaming about seeing a ghost
- because he's drinking poison
- somebody joking around - something is wrong
- he looked sick/different color eyes - funny thing or bad
- shocked may be sick
- don't swallow things

Picture 2

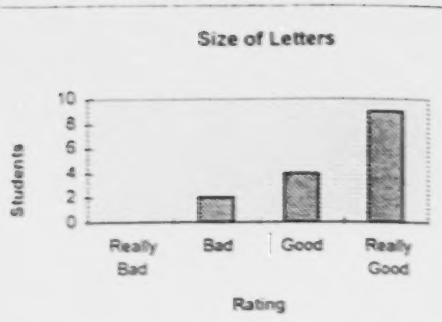
- rabbit eat something good
- rubbing tummy cuz happy and something good
- not doing anything
- rubbing stomach
- he's happy and smiling

Text/Lettering Elements

The majority of the students thought the size of the lettering was okay (Figure 5). This is opposite of the opinion of the researchers.

Are the letters large enough to read?

Figure 5

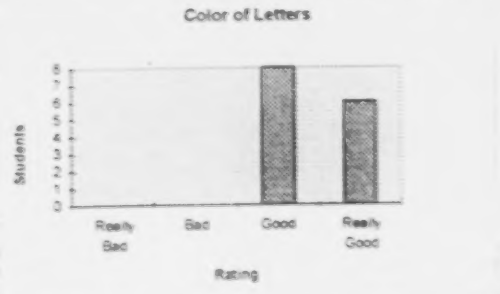


Color

The students like the color of the lettering and the background (Figure 7 and 9). Some students did have suggestion of different colors for both the letters and the background (Figure 8 and 10). The students response is the opposite of research conducted in the field of color. According to research, children prefer warm colors; however, this Web course used cold colors.

Do you like the white colors?

Figure 6



What color would you like to make the letters?

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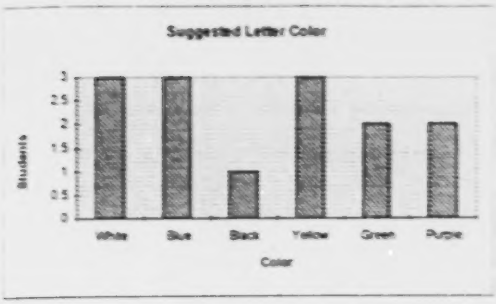
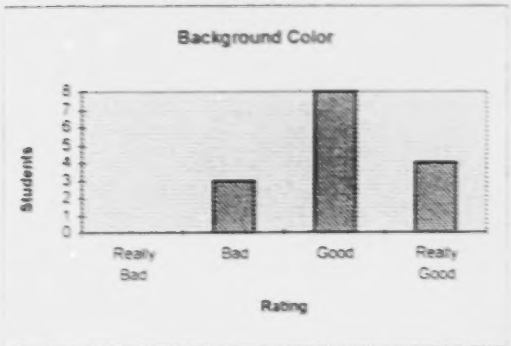
Figure 7



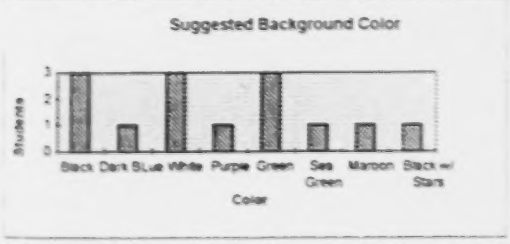
Do you like the black background?

Figure 8



What color would you make the background?

Figure 9

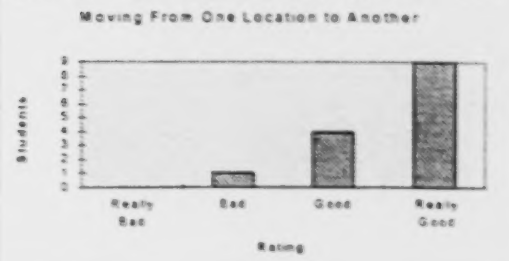


Layout

The students liked the layout of the sites. All of the sites were uniformed and contained the same number of visual designs to help the students. None of the students had difficulty moving from one location to another location in the Web course (Figure 10).

Is it easy to move from one location on the page to another using the icon?

Figure 10



Other comments students mentioned

- have a computer but don't use it
- writing helped - picture no good
- not familiar with screen - like to learn this way
- worked on hi-tech at old school - would like to learn about computers
- exciting to wait - something might pop up
- used computers - not very familiar with on-line - likes this learning
- not familiar with on-line document - pictures not enough detail - no the information not helpful - nice to have picture (don't tell) use mouse

Discussion and Conclusion

The way information is visually designed and synthesized greatly affects how people understand and use that information. Educators have long been aware that conceptual and perceptual styles, past experiences, and cultural background affect the way people learn. Good teachers consider individual differences and learning styles as they teach.

Therefore, the design of quality instructional material involves a learner-centered approach which takes into account the learning

characteristics of the intended audience of the Web site. Each component of the information presentation process for a Web course must be designed with the intended learners age, learning preferences, and culture in mind, in addition to several other characteristics. The quality of information presentation for instructional purposes should be assessed in ways which involves the process of designing, developing and evaluating instructional material. Therefore, the Web Designer must incorporate the learner in the design and development stage of the course along with the use of the learner during the formative and summative evaluation of the course.

Further Research

Further research needs to be conducted on how elementary students perceive visual design. The questions that still remain to be asked are:

- Do designers of Web Courses pilot their course with elementary students before implementation of the course?
- Do students prefer to use visuals to help them understand information being presented?
- What changes could be made to improve the visuals in the Web site, used in the study, from the students' perception?

Reference

Ausubel, D.(1968) Educational Psychology. New York: Holt, Rinehart and Winston.

Dick, W. and L. Carey, (1996) The Systematic Design of Instruction. New York: Harper Collins.

El-Tigi , M. & Branch, R. M. (in press). Interaction, feedback, and student control to facilitate learning on the Web.

Faiola, T., and Debloois, M. L. (1988) Designing a Visual factors-Based Screen Display Interface: The New Role of the Graphic Technologist. *Educational Technology*, August, 12-21.

Heinich, R., Molenda, M., and Russell, J.D., (1993) Instructional Media and the New Technologies of Instruction. New York: Macmillan Publishing Company.

Lucas, L. (1991). Visually Designing the Computer-Learner Interface. *Educational Technology*, July, 56-58.

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